What is claimed is:

1. An amplifying circuit that is connected to a secondary winding of a transformer with a primary winding and the secondary winding, comprising:

a current amplifying section that amplifies current flowing into the secondary winding of the transformer to output the amplified current via a first impedance element; and

a buffer amplifying section that generates current determined by voltage applied to the first impedance element by said current amplifying section to apply to a second impedance element, thereby outputting current from the second impedance element,

wherein current, corresponding to current obtained by amplifying current flowing into the primary winding of the transformer, is output from each of the first impedance element and the second impedance element at a ratio determined by an impedance ratio between the first impedance element and the second impedance element.

2. The amplifying circuit according to claim 1, wherein said buffer amplifying section includes a voltage amplifying circuit that voltage-amplifies voltage of the first impedance element and applies the voltage to the second impedance element.

3. The amplifying circuit according to claim 1, wherein said current amplifying section amplifies the voltage of the first impedance element to apply to the second impedance element, and serves as at least a part of said buffer amplifying section.

4. The amplifying circuit according to claim 2, wherein said current amplifying section includes:

a first NPN-type bipolar transistor having a collector connected to a positive pole of a DC power source, an emitter connected to one end of the secondary winding of the transformer, and a base connected to the other end of the secondary winding of the transformer; and

a first PNP-type bipolar transistor having a collector connected to a negative pole of the DC power source, an emitter connected to the emitter of said first NPN-type bipolar

transistor, and a base connected to the base of said first NPN-type bipolar transistor, and

said buffer amplifying section includes:

a second NPN-type bipolar transistor having a collector connected to the positive pole of the DC power source and the collector of said first NPN-type bipolar transistor, and a base connected to the base of said first NPN-type bipolar transistor; and

a second PNP-type bipolar transistor having a collector connected to the negative pole of the DC power source and the collector of said first PNP-type bipolar transistor, an emitter connected to the emitter of said second NPN-type bipolar transistor, and a base connected to the base of said first PNP-type bipolar transistor,

wherein one end of the first impedance element is connected to a node between the base of said NPN-type bipolar transistor and the base of said first PNP-type bipolar transistor, and one end of the second impedance element is connected to a node between the emitter of said second NPN-type bipolar transistor and the emitter of said second PNP-type bipolar transistor.

5. The amplifying circuit according to claim 3, wherein said current amplifying section includes:

an NPN-type bipolar transistor having a collector connected to the positive pole of the DC power source, an emitter connected to one end of the secondary winding of the transformer, and a base connected to the other end of the secondary winding of the transformer; and

a PNP-type bipolar transistor having a collector connected to the negative pole of the DC power source, an emitter connected to the emitter of said NPN-type bipolar transistor, and a base connected to the base of said NPN-type bipolar transistor,

wherein one end of the first impedance element is connected to a node between the base of said NPN-type bipolar transistor and the base of said PNP-type bipolar transistor, and one end of the second impedance element is connected to a node between the emitter of said NPN-type bipolar transistor and the emitter of said PNP-type bipolar transistor.

6. The amplifying circuit according to claim 2, wherein said current amplifying section includes:

a first N-type field effect transistor having a drain connected to the positive pole of the DC power source, a source connected to one end of the secondary winding of the transformer, and a gate connected to the other end of the secondary winding of the transformer; and

a first P-type field effect transistor having a drain connected to the negative pole of the DC power source, a source connected to the source of said first N-type field effect transistor, and a gate connected to the gate of said first N-type field effect transistor, and

said buffer amplifying section includes:

a second N-type field effect transistor having a drain connected to the positive pole of the DC power source and the drain of said first N-type field effect transistor, and a gate connected to the gate of said first N-type field effect transistor; and

a second P-type field effect transistor having a drain connected to the negative pole of the DC power source and the drain of said first P-type field effect transistor, a source connected to the source of said second N-type field effect transistor, and a gate connected to the gate of said first P-type field effect transistor,

wherein one end of the first impedance element is connected to a node between the gate of said first N-type field effect transistor and the gate of said first P-type field effect transistor, and one end of the second impedance element is connected to a node between the source of said second N-type field effect transistor and the source of said second P-type field effect transistor.

7. The amplifying circuit according to claim 3, wherein said current amplifying section includes:

an N-type field effect transistor having a drain connected to the positive pole of the DC power source, a source connected to one end of the secondary winding of the transformer, and a gate connected to the other end of the secondary winding of the

transformer; and

a P-type field effect transistor having a drain connected to the negative pole of the DC power source, a source connected to the source of said N-type field effect transistor, and a gate connected to the gate of said N-type field effect transistor,

wherein one end of the first impedance element is connected to a node between the gate of said N-type field effect transistor and the gate of said P-type field effect transistor, and one end of the second impedance element is connected to a node between the source of said N-type field effect transistor and the source of said P-type field effect transistor.

8. The amplifying circuit according to claim 1, wherein the first impedance element and the second impedance element are formed of capacitors, respectively.

9. An amplifying circuit comprising:

an NPN-type bipolar transistor having an emitter connected to one end of a secondary winding of a transformer with a primary winding and the secondary winding, a collector connected to a positive pole of a DC power source;

a first resistor connected between the collector of said NPN-type bipolar transistor and a base of said NPN-type bipolar transistor;

a first voltage drop element connected between the base of said NPN-type bipolar transistor and the other end of the secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said NPN-type bipolar transistor;

a PNP-type bipolar transistor having an emitter connected to one end of the secondary winding of the transformer, a collector connected to a negative pole of the DC power source;

a second resistor connected between the collector of said PNP-type bipolar transistor and a base of said PNP-type bipolar transistor;

a second voltage drop element connected between the base of said PNP-type bipolar transistor and the other end of the secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said PNP-type bipolar transistor;

and

a current supply capacitor having one end connected to a node between said first voltage drop element and said second voltage drop element,

wherein current flowing into the primary winding of the transformer is amplified and the amplified current is output via said current supply capacitor.

10. The amplifying circuit according to claim 9, further comprising a gain correction capacitor having one end connected to a node between the emitter of said NPN-type bipolar transistor and the emitter of said PNP-type bipolar transistor,

wherein current flowing into the primary winding of the transformer is amplified, and the amplified current is output from each of said current supply capacitor and said gain correction capacitor at a ratio determined by an impedance ratio between said current supply capacitor and said gain correction capacitor.

11. An amplifying circuit comprising:

a PNP-type bipolar transistor having an emitter connected to one end of a first secondary winding of a transformer with a primary winding and first and second secondary windings;

a first resistor connected between a collector of said PNP-type bipolar transistor and a base of said PNP-type bipolar transistor;

a first voltage drop element connected between the base of said PNP-type bipolar transistor and the other end of the first secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said PNP-type bipolar transistor;

an NPN-type bipolar transistor having an emitter connected to one end of a second secondary winding of the transformer, a collector connected to the collector of said PNP-type bipolar transistor;

a second resistor connected between a collector of said NPN-type bipolar transistor and a base of said NPN-type bipolar transistor;

a second voltage drop element connected between the base of said NPN-type bipolar

transistor and the other end of the second secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said NPN-type bipolar transistor; and

a current supply capacitor having one end connected to a node between the collector of said PNP-type bipolar transistor and the collector of said NPN-type bipolar transistor,

wherein a positive pole of a DC power source is connected to the other end of the first secondary winding of the transformer, and a negative pole of the DC power source is connected to the other end of the second secondary winding, and current flowing into the primary winding of the transformer is amplified and the amplified current is output via said current supply capacitor.

12. An amplifying circuit comprising:

a first NPN-type bipolar transistor having an emitter connected to one end of a first secondary winding of a transformer with a primary winding and first and second secondary windings, a collector connected to a positive pole of a DC power source;

a first resistor connected between the collector of the first NPN-type bipolar transistor and a base of the first NPN-type bipolar transistor;

a first voltage drop element connected between the base of said first NPN-type bipolar transistor and the other end of the first secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said first NPN-type bipolar transistor;

a second NPN-type bipolar transistor having an emitter connected to one end of the second secondary winding of the transformer, a collector connected to the other end of the first secondary winding of the transformer;

a second resistor connected between the collector of the second NPN-type bipolar transistor and a base of the second NPN-type bipolar transistor;

a second voltage drop element connected between the base of said second NPN-type bipolar transistor and the other end of the second secondary winding of the transformer to

generate a voltage drop corresponding to a base-emitter voltage of said second NPN-type bipolar transistor; and

a current supply capacitor having one end connected to a node between the other end of the first secondary winding of the transformer and the collector of said second NPN-type bipolar transistor,

wherein a negative pole of the DC power source is connected to the other end of the second secondary winding of the transformer, and current flowing into the primary winding of the transformer is amplified and the amplified current is output via said current supply capacitor.

13. An amplifying circuit comprising:

a first NPN-type bipolar transistor having an emitter connected to one end of a first secondary winding of a transformer with a primary winding and first and second secondary windings;

first and second resistors connected in series between a positive pole of a DC power source and a base of said first NPN-type bipolar transistor;

a first field effect transistor having one end of either a drain or a source connected to the positive pole of the DC power source and one end of said first resistor, the other end of either the drain or the source connected to a collector of said first NPN-type bipolar transistor, and a gate connected to a node between said first resistor and said second resistor;

a first voltage drop element connected between the base of said first NPN-type bipolar transistor and the other end of the first secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said first NPN-type bipolar transistor;

a second NPN-type bipolar transistor having an emitter connected to one end of the second secondary winding of the transformer;

third and fourth resistors connected in series between the other end of the first

secondary winding of the transformer and a base of said second NPN-type bipolar transistor;

a second field effect transistor having one end of either a drain or a source connected to the other end of the first secondary winding of the transformer, the other end of either the drain or the source connected to a collector of said second NPN-type bipolar transistor, and a gate connected to a node between said third resistor and said fourth resistor;

a second voltage drop element connected between the base of said second NPN-type bipolar transistor and the other end of the second secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said second NPN-type bipolar transistor; and

a current supply capacitor having one end connected to a node between the other end of the first secondary winding of the transformer and one end of said second field effect transistor,

wherein a negative pole of the DC power source is connected to the other end of the second secondary winding of the transformer, and current flowing into the primary winding of the transformer is amplified and the amplified current is output via said current supply capacitor.

14. An amplifying circuit comprising:

a first PNP-type bipolar transistor having an emitter connected to one end of a first secondary winding of a transformer with a primary winding and first and second secondary windings, a collector connected to one end of the second secondary winding of the transformer;

a first resistor connected between the collector of the first PNP-type bipolar transistor and a base of the first PNP-type bipolar transistor;

a first voltage drop element connected between the base of said first PNP-type bipolar transistor and the other end of the first secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said first PNP-type

bipolar transistor;

a second PNP-type bipolar transistor having an emitter connected to the other end of the second secondary winding of the transformer, a collector connected to a negative pole of a DC power source;

a second resistor connected between the collector of the second PNP-type bipolar transistor and a base of the second PNP-type bipolar transistor;

a second voltage drop element connected between the base of said second PNP-type bipolar transistor and one end of the second secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said second PNP-type bipolar transistor; and

a current supply capacitor having one end connected to a node between the collector of said first PNP-type bipolar transistor and one end of the second secondary winding of the transformer,

wherein a positive pole of the DC power source is connected to the other end of the first secondary winding of the transformer, and current flowing into the primary winding of the transformer is amplified and the amplified current is output via said current supply capacitor.

15. The amplifying circuit according to claim 9, further comprising a capacitor connected in parallel to said first voltage drop element, and a capacitor connected in parallel to said second voltage drop element.

16. An amplifying circuit comprising:

an NPN-type bipolar transistor having an emitter connected to one end of a secondary winding of a transformer with a primary winding and the secondary winding, a collector connected to a positive pole of a DC power source;

a first resistor connected between the collector of said NPN-type bipolar transistor and a base of said NPN-type bipolar transistor;

a PNP-type bipolar transistor having an emitter connected to the emitter of said

NPN-type bipolar transistor, a collector connected to a negative pole of the DC power source;

a second resistor connected between the collector of said PNP-type bipolar transistor and a base of said PNP-type bipolar transistor;

first and second voltage drop elements connected in series between the base of said NPN-type bipolar transistor and the base of said PNP-type bipolar transistor to generate voltage drops corresponding to a base-emitter voltage of said NPN-type bipolar transistor and an emitter-base voltage of said PNP-type bipolar transistor;

a first capacitor connected between the base of said NPN-type bipolar transistor and the other end of the secondary winding of the transformer;

a second capacitor connected between the base of said PNP-type bipolar transistor and the other end of the secondary winding of the transformer; and

a current supply capacitor having one end connected to the other end of the secondary winding of the transformer,

wherein current flowing into the primary winding of the transformer is amplified and the amplified current is output via said current supply capacitor.

17. The amplifying circuit according to claim 16, further comprising a gain correction capacitor having one end connected to a node between the emitter of said NPN-type bipolar transistor and the emitter of said PNP-type bipolar transistor,

wherein current flowing into the primary winding of the transformer is amplified, the amplified current is output from each of said current supply capacitor and said gain correction capacitor at a ratio determined by an impedance ratio between said current supply capacitor and said gain correction capacitor.

18. The amplifying circuit according to claim 9, wherein said first and second voltage drop elements are formed of diodes.

19. The amplifying circuit according to claim 9, wherein said voltage drop elements and bipolar transistors are arranged close to one another.

20. The amplifying circuit according to claim 19, wherein said voltage drop elements and said bipolar transistors are formed on the same substrate of a semiconductor.

21. An amplifying circuit that is connected to a secondary winding of a transformer with a primary winding and the secondary winding, comprising:

a control section that has a current path and a control terminal where one end of the secondary winding of the transformer is connected to one end of the current path to control an amount of current flowing into the secondary winding of the transformer based on voltage between one end of the secondary winding and the control terminal; and

a voltage adjusting section that adjusts voltage of the other end of the secondary winding such that voltage between one of the secondary winding of the transformer and the other end thereof is set to zero,

wherein current flowing into the primary winding of the transformer is amplified and the amplified current is output to an external section via an impedance element.

22. The amplifying circuit according to claim 21, wherein

said control section is comprised of a transistor;

one end of the current path is an emitter of the transistor, the other end is a collector of the transistor, the control terminal is a base of the transistor, and one end of the secondary winding of the transformer is connected to the emitter; and

the transistor controls the amount of current flowing into the secondary winding of the transformer based on voltage between one end of the secondary winding and the base.

23. The amplifying circuit according to claim 21, wherein said voltage adjusting section is formed of diodes connected between the other end of the secondary winding of the transformer and the control terminal of said control section.

24. A noise reducing apparatus that reduces noise propagating from a predetermined power source to a pair of power lines for power supply, comprising:

a transformer that uses the pair of power lines as a primary winding to detect a leakage current leaking into a ground line from the pair of power lines; and

the amplifying circuit described in claim 1 that amplifies current flowing into the primary winding of the transformer to output the amplified current from each of a first impedance element and a second impedance element at a ratio determined by a ratio between the first impedance element and the second impedance element such that the amplified current is supplied to a ground line in a direction that cancels the leakage current at a power source side instead of the transformer.

25. The noise reducing apparatus according to claim 24, wherein said amplifying circuit amplifies current flowing into the primary winding of the transformer such that a current value of current to be supplied to the ground line becomes equal to a current value of the leakage current detected by the transformer.

26. A noise reducing apparatus that reduces noise propagating from a predetermined power source to a pair of power lines for power supply, comprising:

a transformer that uses the pair of power lines as a primary winding to detect a leakage current leaking into a ground line from the pair of power lines; and

the amplifying circuit described in claim 9 that amplifies current flowing into the primary winding of the transformer to supply the amplified current to a ground line in a direction that cancels the leakage current at a power source side instead of the transformer.

27. The noise reducing apparatus according to claim 26, wherein said amplifying circuit amplifies current flowing into the primary winding of the transformer such that a current value of current to be supplied to the ground line becomes equal to a current value of the leakage current detected by the transformer.

28. A noise reducing apparatus that reduces noise propagating to a pair of power lines for power supply, comprising:

a leakage current detecting section that detects current induced by an output winding of a transformer having the output winding passing through a magnetic core with the power lines, thereby detecting a leakage current caused by noise flowing into a ground

line from the power lines; and

a current supplying section that supplies a compensation current for canceling the leakage current to the injection point which is on the ground line closer to an input of the power lines than a leakage current detecting point, wherein the current supplying section uses the leakage current detected by said leakage current detecting section as the compensation current.

29. The noise reducing apparatus according to claim 28, wherein the power lines and the output winding pass through the magnetic core only one time, respectively.

30. The noise reducing apparatus according to claim 28, wherein the magnetic core of the transformer has a shape dividable into a plurality of portions and the divided portions are combinable, thereby allowing the power lines to be passed through the magnetic core without cutting the power lines.

31. The noise reducing apparatus according to claim 28, wherein the transformer induces current having a current value equal to a zero-phase current of the power lines to the output winding.

32. The noise reducing apparatus according to claim 28, wherein said current supplying section includes an amplifying circuit that amplifies the leakage current detected by said leakage current detecting section, and said amplifying circuit amplifies current to be supplied to the ground line with an amplitude set to 1, when power is supplied from a predetermined DC power source.

33. The noise reducing apparatus according to claim 32, wherein said amplifying circuit includes an NPN transistor, a PNP transistor and a capacitor, a collector of said NPN transistor is connected to a positive pole of a DC power source, an emitter of said PNP transistor is connected to an emitter of said NPN transistor, a collector of said PNP transistor is connected to a negative pole of the DC power source, one output terminal of said leakage current detecting section is connected to a base of said NPN transistor and a base of said PNP transistor, the other output terminal of said leakage current detecting

section is connected to the emitter of said NPN transistor and the emitter of said PNP transistor, and said capacitor is connected between the ground line and the bases of said NPN transistor and said PNP transistor.

34. The noise reducing apparatus according to claim 32, wherein said amplifying circuit is an amplifying circuit connected to a secondary winding of a transformer with a primary winding and a secondary winding, said amplifying circuit includes a current amplifying section that amplifies current flowing into the secondary winding of the transformer to output via a first impedance element; and a buffer amplifying section that applies voltage corresponding to voltage applied to the first impedance element by said current amplifying section to a second impedance element to output current from the second impedance element, current corresponding to current obtained by amplifying current flowing into the primary winding of the transformer is output from each of the first impedance element and the second impedance element at a ratio determined by an impedance ratio between the first impedance element and the second impedance element.

35. The noise reducing apparatus according to claim 32, wherein said amplifying circuit includes an NPN-type bipolar transistor having an emitter connected to one end of a secondary winding of a transformer with a primary winding and the secondary winding, a collector connected to a positive pole of a DC power source, a first resistor connected between the collector of the NPN-type bipolar transistor and a base of the NPN-type bipolar transistor, a first voltage drop element connected between the base of said NPN-type bipolar transistor and the other end of the secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said NPN-type bipolar transistor, a PNP-type bipolar transistor having an emitter connected to one end of the secondary winding of the transformer, a collector connected to a negative pole of the DC power source, and a second resistor connected between the collector of the PNP-type bipolar transistor and the base of the PNP-type bipolar transistor; a second voltage drop element connected between the base of said PNP-type bipolar transistor and the other end

of the secondary winding of the transformer to generate a voltage drop corresponding to a base-emitter voltage of said PNP-type bipolar transistor; and a current supply capacitor having one end connected to a node between said first voltage drop element and said second voltage drop element, and current flowing into the primary winding of the transformer is amplified and the amplified current is output via said current supply capacitor.

36. A power converting apparatus comprising:

a power converting section that converts power supplied from a power source into power with a predetermined voltage to supply to a load; and

the noise reducing apparatus described in claim 24 that reduces noise propagating to a pair of power lines for power supply from the power source to said power converting section.

37. A power converting apparatus comprising:

a power converting section that converts power supplied from a power source into power with a predetermined voltage to supply to a load; and

the noise reducing apparatus described in claim 26 that reduces noise propagating to a pair of power lines for power supply from the power source to said power converting section.

38. A power converting apparatus comprising:

a power converting section that converts power supplied from a power source into power with a predetermined voltage to supply to a load; and

the noise reducing apparatus described in claim 28 that reduces noise propagating to a pair of power lines for power supply from the power source to said power converting section.

39. The power converting apparatus according to claim 38, wherein said power converting section includes a transformer, and the transformer further includes an auxiliary winding that forms a DC power source for supplying power to the current

supplying section that said noise reducing apparatus includes.

40. The power converting apparatus according to claim 38, wherein said power converting section includes an inverter circuit and a control circuit that controls the inverter circuit, and an operating power source for said control circuit, and the operating power source is used as a DC power source for supplying power to the current supplying section that said noise reducing apparatus includes.